Star schema

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The **star schema** (sometimes referenced as star join schema) is the simplest style of <u>data warehouse</u> <u>schema</u>, consisting of a few "<u>fact tables</u>" (possibly only one, justifying the name) referencing any number of "<u>dimension tables</u>". The "facts" that the data warehouse helps analyze are classified along different "dimensions": the fact tables hold the main data, while the usually smaller dimension tables describe each value of a dimension and can be joined to fact tables as needed.

Dimension tables have a simple <u>primary key</u>, while fact tables have a compound <u>primary key</u> consisting of the aggregate of relevant dimension keys.

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It is common for dimension tables to consolidate redundant data and be in <u>second normal form</u>, while fact tables are usually in <u>third normal form</u> because all data depend on either one dimension or all of them, not on combinations of a few dimensions.

The star schema is a way to implement multi-dimensional database (<u>MDDB</u>) functionality using a mainstream <u>relational database</u>: given the typical commitment to relational databases of most organizations, a specialized multidimensional DBMS is likely to be both expensive and inconvenient.

Another reason for using a star schema is its simplicity from the users' point of view: queries are never complex because the only joins and conditions involve a fact table and a single level of dimension tables, without the indirect dependencies to other tables that are possible in a better normalized <u>snowflake schema</u>.

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[edit] Example

Consider a database of sales, perhaps from a store chain, classified by date, store and product.

`f_sales` is the fact table and there are three dimension tables `d_date`, `d_store` and `d_product`.

Each dimension table has a primary key called `id`, corresponding to a three-column primary key (`date_id`, `store_id`, `product_id`) in `f_sales`.

Data columns include `f_sales.units_sold` (and sale price, discounts etc.); `d_date.year` (and other date components); `d_store.country` (and other store address components); `d_product. category` and `d_product.brand` (and product name etc.).

The following query extracts how many TV sets have been sold, for each brand and country, in 1997.

```
SELECT
    P.brand, S.country, sum (FS.units_sold)
FROM
    f_sales FS
    INNER JOIN d_date D ON D.id = FS.date_id
    INNER JOIN d_store S ON S.id = FS.store_id
    INNER JOIN d_product P ON P.id = FS.product_id
WHERE
    D.year = 1997
    AND
    P.category = 'tv'
GROUP BY
    P.brand, S.country
```

[edit] See also

- Snowflake schema

[edit] References

- Darmawikarta, Djoni (2007); *Dimensional Data Warehousing with MySQL*, Pub. BrainySoftware. ISBN 0975212826.

[edit] External links

- Designing the Star Schema Database by Craig Utley
- Star Schema for Retail Sales
- Stars: A Pattern Language for Query Optimized Schema
- Star schema optimizations

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